

## BOOK REVIEW

MONOGRAPHIE DER SCARABAEIDAE UND APHODIIDAE DER PALAE-ARCTISCHEN UND ORIENTALISCHEN REGION, COLEOPTERA: LAMELLICORNIA, VOLS. 1 & 2. By Vladimir Balthasar. Verlag der Tschechoslowakischen Akademie der Wissenschaften, Prague; Vol. 1, 391 pages, 137 figures, 24 plates; Vol. 2, 627 pages, 226 figures, 16 plates. 1963.

The appearance of Dr. Balthasar's *magnum opus* has been eagerly awaited for some time. The manuscript for it seems to have been completed in 1959 or earlier. In that year, several American colleagues received a mimeographed circular from the Publishing House of the Czech Academy requesting their participation in a "promotion campaign" for the monograph, apparently for the purpose of gauging its sales potential. In May of the same year this reviewer also received a letter from the Czech Academy explaining that there would be a delay in publication because of the high costs, and that "it is therefore a question of reducing the expected financial loss to an amount which will make it bearable and enable us to fulfill our duties to other authors as well." This hesitation, puzzling at the time, becomes a little more understandable now that we see the lavishness of the final product. The two volumes are printed on high-quality paper and profusely illustrated with line drawings, maps, and photographs. There appear to be few typographical errors and the books are finely bound in hard, gold-embossed covers provided with colorful jackets. The Publishing House of the Czech Academy is to be congratulated on a superb presentation. The delay of at least five years in publication, however, means that the reader must allow for the omission of recent data on the groups covered.

With these two volumes (and a third on Aphodiinae soon to appear) Dr. Balthasar crowns 35 years of experience with the Scarabaeinae and Aphodiinae of the world, during which he has published about 125 papers and books on these groups. As he says in the introduction, "hundreds of thousands of specimens have passed through my hands . . . the greater part of the Scarabaeoid material of all large European museums is known to me . . . and the material from most of the entomological expeditions of the last decades has been entrusted to me." He has described many new species during this time, mostly in the Aphodiinae and New World Scarabaeinae. Evidently Dr. Balthasar's qualifications for undertaking a work of this scope are not to be doubted.

Volumes 1 and 2 deal with what is commonly known as the Scarabaeinae or Coprinae. The first volume begins with general remarks on the "Superfamily Scarabaeoidea" (Family Scarabaeidae of most workers) and a conspectus of the families, subfamilies, and tribes. This is followed by brief introductions to morphological features, internal anatomy, larval morphology, brood care, feeding ecology, ecological distribution, parasites, phylogeny (including fossils), and geographical distribution. The subsequent systematic part, which occupies seven eighths of the work, begins with a key to the laparostict families and subfamilies of the Palearctic and Oriental regions, and continues with a detailed account of all taxa down to species of the "Family Scarabaeidae"; this is continued into the second volume.

The introductory portion, while occupying only an eighth of the work, is the one non-specialists are likely to read and is the most disappointing. It begins with a conspectus of higher categories, departing radically from that which has become generally accepted by scarabaeidists. For instance, the Passalidae and Lucanidae are placed together in a "Superfamily Lucanoidea," implying that the degree of similarity between them is of the same order as, say, the similarity between "Aphodiidae" and "Aegialidae" (the latter considered a subtribe of Aphodiinae by Landin). On the other hand, acanthocerids, shown by Crowson to be sharply different from other scarabs, are considered to be a subfamily of Trogidae. Throughout, groups are elevated at least one rank above what they are considered to be by other specialists. One consequence of this is that the subtribes of Scarabaeinae (Coprina, Pinotina, etc.), originally proposed by Peringuey in 1901 and perpetuated by Gillet and Janssens, are now elevated to "tribes" of "Scarabaeidae." Since there is serious doubt about the validity of some of these subtribes, it is indeed unfortunate that their status should now be elevated. It is not that changes in the classification are unjustified, but simply that when a radical departure from custom is adopted, it should be ac-



accompanied by a thorough explanation. No explanation at all is given for these changes; this is all the more puzzling since in Dr. Balthasar's previous monograph (Fauna CSR, Vol. 8, 1958) he adhered to the accepted classification of Janssens.

The morphological section is but a slightly expanded version of the same section in the Fauna CSR, with examples drawn mostly from the Geotrupinae, Melolonthinae, Cetoniinae, etc.—groups covered in the Fauna CSR but not covered in the present monograph. The extremely modified mouthparts of adult Scarabaeinae, which are of great interest and pertinence to the present work, are not illustrated. Such data as are presented on both external and internal morphology are sketchy and inadequate for any conceivable purpose. In the larval section, which is largely based on Medvedev's survey, there is no mention of Böving's studies on epipharyngeal chaetotaxy, on which larval classification is often based in the English-language literature. Quite astonishing is the total omission of any reference to Gardner's very significant studies on Indian scarab larvae; this is particularly surprising because these fall directly within the geographical scope of the work.

The section on brood care is compiled largely from von Lengerken's book and is therefore reasonably reliable. However, there are a few original remarks which are seriously misleading. For instance, on p. 42, immediately after mentioning the size of the ball in *Heliocopris*, the author proceeds in the next sentence to talk about the fights that ensue when balls are rolled over the surface, implying to the unwary reader that *Heliocopris* rolls balls. On the other hand, Dr. Balthasar is undoubtedly on firm ground when he insists that the behavioral adaptations of "Scarabaeidae" are responses to steppe conditions.

In the section on food ecology, Dr. Balthasar repeatedly resorts to curious lines of reasoning in insisting that coprophagy must largely be limited to ungulate dung. His conclusion that saprophagy was the original type of feeding in "Scarabaeidae" (a reasonable assumption) is based on the reasoning that when the group first arose, ungulates were not yet evolved. Marsupials, for instance, could "scarcely" have provided the necessary food for coprophages. The "strict bond" between dung beetles and ungulates must have posed "great impediments" to the former's early dispersal. This reviewer would like to know why the dung of marsupials, or even herbivorous reptiles, could not have served just as well. It is possible that the association we see today between dung beetles and ungulates (by no means exclusive) is due to the fact that ungulates are more abundant now than kangaroos or dinosaurs. Dr. Balthasar refuses to admit that the guests of the Florida land tortoise, for instance, could feed on tortoise dung; he says that they must feed on rabbit or owl pellets in the burrows. Literature records of dung beetles feeding on bird excrement are categorically rejected. Similar assertive statements are made regarding myrmecophily. He says that cetoniines such as *Potosia* must be accidental in ants' nests since they are not modified morphologically for myrmecophily. Actually, mounting evidence indicates that many groups of Cetoniinae are associated with ants, at least in the larval stages. Finally, numerous but very incomplete data taken from modern Latin American workers are cited without indication of their source anywhere in the book.

Tables listing myrmecophilous species, parasites and their hosts, and Tertiary fossils will prove useful to other workers.

It is very unfortunate that Dr. Balthasar saw fit to detract from the great overall value of this monograph by including introductory remarks which are gravely deficient in most respects, and furthermore presenting these with the implication that they are complete, authoritative, and applicable to the world as whole. It would have been far better to restrict these to only what is necessary to introduce the main taxonomic portion.

The taxonomic portion, making up the greater bulk of the work, begins after a brief but interesting zoogeographical survey. In bringing together a vast amount of data on the Palaearctic and Oriental members of the Scarabaeinae, Dr. Balthasar has done present and future workers enormous service. Descriptions of rare genera and species, previously scattered in many works, will prove extremely useful. The key to species are very complete, presenting a wide choice of characters for use in identification; in this respect the keys are far superior to those of Arrow in the Fauna of British India. Particularly herculean was the task of constructing a key to the species

of *Onthophagus* (555 of them). The key to species of the Subgenus *Onthophagus* alone comprises 868 couplets. Seven new subgenera and two new species of *Onthophagus* are described, these being the only new taxa in the monograph. For each species throughout the work, a brief description, an indication of geographical and altitude distribution, and some ecological information, if known, are given. For each genus or subgenus there is a description and some ecological remarks, plus a world distribution map. Original habitus drawings are scattered profusely throughout and, although a little sketchy, they will aid greatly in identification and contribute much to the attractiveness of the work, as do the many habitus photographs at the end of each volume.

American workers will find some special objections throughout the work. Aside from omitting all references to Americans, while at the same time using some of their data (as previously mentioned), Dr. Balthasar rejects the current American usage of the names *Dichotomius* and *Ateuchus* for what used to be *Pinotus* and *Choeridium* (with what justification this reviewer is not prepared to say). He presents a table of world canthonine genera on p. 257 which, in addition to being out of place in a work of this geographic scope, is also hopelessly incomplete at present, as it was bound to be since the American canthonine studies were just beginning when Dr. Balthasar was writing. On almost every distribution map presented, the American portions of the distributions are erroneous. For instance, on p. 137 the map purports to show the distribution of Scarabaeini (the Subtribe Scarabaeina of other workers) and has this group occupying most of the Western Hemisphere! This group, of course, is absent from the Western Hemisphere. On p. 234 *Sisyphus* is shown to occur in Mexico, but not in Nicaragua, whence it has been known since Belt's time. On p. 318 the genus *Copris* is shown to occur on the Galapagos Islands (known to be an erroneous or at least highly dubious citation for many years) and in Baja California (!), but not in Colombia or Ecuador, where it does occur.

In spite of the numerous errors committed whenever the author departed from the strict limits of the taxonomy of Palaearctic and Oriental species, the present monograph is of very great importance because it is the first attempt to cover such a vast area. Workers in Oriental Scarabaeinae will find it supersedes Arrow's Fauna of British India (Lamellicornia, Vol. 3) and Paulian's Faune de l'Empire Français (Vol. 3). In the Palaearctic, it partly fills the lacuna left by the omission of the laparostictids from Medvedev's Fauna SSSR (Vol. 10). The appearance of Dr. Balthasar's work will give great impetus to the further study of this extremely interesting group of beetles.—ERIC G. MATTHEWS, *University of Puerto Rico, Rio Piedras, Puerto Rico.*



All the woods hushed—save for a dripping rose,  
All the woods dim—save where a glow-worm glows.

Masefield, *The Watch in the Wood*